CLAIMS

1. A method for attenuating sound in a duct, the sound to be attenuated being detected in the method by means of a detector (2) and the attenuation being performed by means of two successive actuator elements (3, 4), **characterized** in that sound is attenuated by means of two successive monopole elements (3, 4) in such a way that both elements (3, 4) function as a dipole approximation and also produce a monopole radiation needed, a dipole control signal being fed to both elements (3, 4) at a phase shift which is 180° between the two elements and a monopole control signal being fed to the elements (3, 4) cophasally.

2. A method according to claim 1, **characterized** in that the control signal of the first actuator element (3) is

$$q_1 = \tfrac{1}{2}(a/jkd - b/2)q_i,$$

and the control signal of the second actuator element (4) is

$$q_2 = -\tfrac{1}{2}(a/jkd + b/2)q_i,$$

where

j is an imaginary unit;
k is a wave number = ω/c_0;
ω is an angular frequency;
c_0 is sound velocity in a medium;
d is a distance between the actuator elements (3, 4);
q_i is the sound pressure to be attenuated, located at the centre of the actuator elements (3, 4), and converted to a volume velocity quantity;
a is a constant or a dipole part control function; and
b is a constant or a monopole part control function.

3. A method according to claim 2, **characterized** in that a is a dipole part control function and b is a monopole part function such that

$$a = \frac{kd/2}{\sin(kd/2)}$$

and

$$b = \frac{1}{\cos(kd/2)}.$$

4. A method according to claim 2 ~~or 3~~, **characterized** in that in the control signals (q_1, q_2) of the elements the impact of the imaginary unit is determined by using an integrator.

~~5~~. An equipment for attenuating sound in a duct, the equipment comprising a detector (2) for detecting the sound to be attenuated and two successive actuator elements (3, 4) for producing a sound attenuating counter-sound, **characterized** in that the actuator elements (3, 4) are monopole elements which are arranged to function as a dipole approximation and to also produce a necessary monopole radiation and that the equipment comprises means for feeding a dipole control signal to both elements (3, 4) at a phase shift which is 180° between the two elements and for feeding a monopole control signal to the elements (3, 4) cophasally.

6. An equipment according to claim 5, **characterized** in that the control signal of the first actuator element (3) is

$$q_1 = \tfrac{1}{2}(a/jkd - b/2)q_i,$$

and the control signal of the second actuator element (4) is

$$q_2 = -\tfrac{1}{2}(a/jkd + b/2)q_i,$$

where

j is an imaginary unit;
k is a wave number = ω/c_0;
ω is an angular frequency;
c_0 is sound velocity in a medium;
d is a distance between the actuator elements (3, 4);
q_i is the sound pressure to be attenuated, located at the centre of the actuator elements (3, 4), and converted to a volume velocity quantity;
a is a constant or a dipole part control function; and
b is a constant or a monopole part control function.

7. An equipment according to claim 6, **characterized** in that a is a dipole part control function and b is a monopole part function such that

$$a = \frac{kd/2}{\sin(kd/2)}$$

and

$$b = \frac{1}{\cos(kd/2)}.$$

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